

REMARKS / ARGUMENTS

Claims 3-9, 11-20, 23, 24 and 40-50 are pending. Claims 3-5, 7-9, 11-20, 23, 40-43 and 46-50 stand rejected. Claims 13, 14, 23, 24, 40, 41 and 49 are objected to. By the foregoing amendment, the applicants have amended claims 13, 14, 19, 20, 23, 24, 40, 41, 43, 47 and 49 and canceled claim 50. Claims 51-52 are new. No new matter is added by the amendments. Support for the amendments are found in the specification as filed, for example on pages 28-29 and examples 3 and 6. Reconsideration and allowance are respectfully requested.

On page 2 the Examiner objected to claim 13. Claim 13 is amended. As amended, it is clear that the neutralization reactor connects the lysis reactor to the clarification reactor via the T-type or Y-type connector and tubing system. Accordingly, the applicants request the Examiner withdraw the objection.

On page 3 the Examiner objected to claim 49. Claim 49 is amended. Support for the relationship between the wet cell weight and the yield of the polynucleotides of interest are found in the specification, for example, as shown in examples 3 and 6. Therefore, amended claim 49 is in allowable form. Accordingly, the applicants request the Examiner withdraw the objection.

On pages 2-4 the Examiner objected to claims 40, 50, 14, 23, 41 and 24 for various reasons. Claim 50 is canceled. By the foregoing amendments the applicants have overcome the objections. Accordingly, the applicants request the Examiner withdraw the objections.

On page 4 the Examiner rejected claim 49 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner contends that the term “biomolecule” which “includes any number of envisioned biomolecules of interest” is new matter. By the foregoing amendment to claim 49 the applicants have overcome the rejection. Support for the amendment can be found in the specification as filed, for example, on page 31, paragraph [0115] which discloses polynucleotide, and page 28, paragraph [0106] to page 29, paragraph [0108] which discloses a method for obtaining pDNA. Also, examples 1 and 3-7 of the specification disclose the methods for purifying pDNA from a cell suspension. A skilled artisan would be able to apply the disclosure of the specification to contemporaneous art and conventional and well-known methods for capturing and purifying various polynucleotides such as DNA and RNA and conclude the applicants to be in possession of the claimed invention

at the time of filing. *Hybritech Inc. v. Monoclonal Antibodies, Inc.* 802 F.2d at 1384 (Fed. Cir. 2005).

For example, J. Urthaler et al., *Journal of Biotechnology*, 128: 132-149, 2007 ("Urthaler I"), J. Urthaler et al., *Chem. Eng. Technol.* 28(11): 1408-1420, 2005 ("Urthaler II") and J. Urthaler et al., *Acta Biochemica Polonica*, 52(3): 703-711, 2005 ("Urthaler III"), of which copies are provided for the Examiner's convenience, illustrate the methods for isolating and purifying polynucleotides from bacterial cells that were well-known prior to the filing of the instant application. For example, Urthaler I describes several laboratory-scale methods including the chemical alkaline lysis of bacterial cells to isolate and purify pDNA (pages 133-134 of Urthaler I). Also, Urthaler II discloses that prior to the filing of the instant application, it was shown that RNA, open circular and linearized pDNA are present in the lysate and thus may be further processed and separated during various subsequent purification techniques and methods. Urthaler III summarizes the known methods and techniques of purifying polynucleotides from bacterial cells that were known prior to the filing of the instant application.

In view of the foregoing discussion, a skilled artisan reading the instant specification with the understanding of the aforementioned well-known methods and techniques for purifying polynucleotides from bacterial cells would conclude that the applicants were in possession of the subject matter of amended claim 49 at the time of filing. Therefore, amended claim 49 complies with the written description requirement and is thus in allowable form. Accordingly, the applicants request the Examiner to withdraw the rejection.

On page 6 the Examiner maintained the rejection of claims 3-5, 7-9, 11-20, 23, 40-43 and 46-50 under 35 U.S.C. § 103(a) as being unpatentable over Petersen et al. (U.S. Pat. No. 6,893,879) in view of Nochumson et al. (U.S. 20060106208). The combination of the references does not teach or suggest amended claim 40. Claim 50 is canceled.

Amended claim 40 recites, in part, introducing a flow of the cell suspension and a flow of a lysis solution into the lysis reactor, the lysis reactor containing filling elements made of glass, plastic, stainless steel or fibrous material, such that the flow of the cell suspension and the flow of the lysis solution through the lysis reactor filling elements provides homogenous mixing of the flows in the absence of shear forces and whereby the cultivated host cells of the flowed suspension are substantially disintegrated by alkaline lysis to produce a lysed cell solution.

Amended claim 40 is directed to homogenous mixing of the cell suspension and lysis solution only as the solutions flow through the lysis reactor filling elements. Petersen fails to disclose how a cell suspension and a lysis solution are introduced into a lysis reactor. Petersen also fails to disclose a lysis reactor containing filling elements such that the flow of the cell suspension and the flow of the lysis solution through the lysis reactor filling elements provides homogenous mixing. Rather, Petersen discloses a lysis chamber that “can include filling elements such as glass bead” (*see, e.g.*, col. 3, line 35 and col. 16, lines 12-25). Petersen also teaches lysing of target cells by ultrasonic, physical, chemical or other means such as a combination of these two methods (*see* col. 15, lines 52-53 of Petersen). The ultrasonic lysing includes use of a solid surface (*e.g.*, the filling elements such as glass beads) in combination with ultrasonic energy (*see* col. 3, lines 32-43 of Petersen), while physical lysing includes the use of “the vibration of glass or plastic beads or other particles or by impacting the target cells or viruses onto sharp microstructure” (*see* col. 15, lines 53-58 of Petersen). Additionally, Fig. 19 includes a filter 86 to capture “the components to be lysed” and Fig. 20 includes beads 94 “for rupturing the components captured on the solid phase” (*see* Figs. 19-20, cols. 33-35 of Petersen). Thus, it appears that the filling material that may be present in the lysing chamber of Petersen must retain the sample components in order for ultrasonic rupture or physical rupture to occur, and therefore the cells do not flow through the lysing chamber and therefore can not homogeneously mix with the lysing reagent flowing through the lysis reactor filling elements.

Nochumson fails to cure the deficiency of Petersen. Nochumson discloses that a lysis solution and cells can either be combined without further mixing prior to entering the lysis reactor or else can be introduced in the lysis reactor (pages 7 of the Office Action and paragraphs [0036] and [0055] of Nochumson). The Examiner also contends that Nochumson discloses that flowing lysate and neutralization solution through an inline static mixer in a continuous mode (paragraph [0088] of Nochumson). Nochumson does not disclose homogeneously mixing of the cell suspension and lysis solution when flowing through lysis reactor filling elements. Indeed, the process of Nochumson lacks a lysis reactor that contains filling elements.

In view of the foregoing discussion, the combination of Petersen and Nochumson does not result in the subject matter of amended claim 40. Therefore, amended claim 40 is non-obvious over the cited references and is allowable. Claims 3-5, 7-9, 11-20, 23, 41-43 and 46-49

which depend from claim 40 and recite further limitations are also non-obvious and therefore allowable. Accordingly, the applicants request the Examiner withdraw this rejection.

Applicants submit that all claims pending in the patent application are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited. The fees for a three-month extension and a RCE are included herewith. In the event there are any fees due and owing in connection with this matter, please charge same to our Deposit Account No. 11-0223.

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